For the Examiner's review, a marked-up copy of each of original claims 1, 5, 9, 10, 13, and 15 depicting the amendments thereto is appended hereto in an Appendix B.

REMARKS

The 05 June 2002 Office Action (hereinafter the Office Action) objects to the title as being non-descriptive.

The applicant has amended the title and respectfully requests reconsideration thereof.

The Office Action objects to the disclosure as containing an informality. The Office Action asserts that the phrase "parallel spiral" used throughout the disclosure and the claims is questionable because "spiral" contradicts the straight lines required of "parallel."

The word "parallel," as defined by The American Heritage® Dictionary of the English Language, Fourth Edition, copyright © 2000 by Houghton Mifflin Company, carries the meaning:

> **1.** Being an equal distance apart everywhere...
> **2.** *Mathematics*
> **a.** Of, relating to, or designating two or more straight coplanar lines that do not intersect.
> **b.** Of, relating to, or designating two or more planes that do not intersect.
> **c.** Of, relating to, or designating a line and a plane that do not intersect.
> **d.** Of, relating to, or designating curves or surfaces everywhere equidistant.

In general terms, definition 1 above indicates that any two things, regardless of their convolutions, may be considered

parallel if the are everywhere equidistant. When claim 1 claims "said knurl having a plurality of substantially parallel spiral grooves," it should be understood that, within the limits of manufacturing tolerances, the spiral grooves are everywhere equidistant, i.e., parallel. A significant real-world example of this type of parallelism is railroad tracks, which are understood to be parallel at all times in all locations. Certainly, the "parallel spiral grooves" of the present invention are less convoluted than the railway systems of the world.

In absolute mathematical terms, a cylindrical spiral, such as a screw thread, describes a three-dimensional curve. By definition 2.d above, two such spirals may be parallel if they are everywhere equidistant.

In more specific mathematical terms, a cylindrical spiral is a straight line in a cylindrical space that is neither perpendicular nor parallel to the axis of the cylinder. That is, if a plane having an oblique straight line thereupon is "rolled" to become the surface of a cylinder, then the line will form a spiral. If the plane has parallel oblique straight lines, then those lines form parallel spirals on the surface of the cylinder.

The applicant respectfully requests reconsideration of the term "parallel spiral" as used throughout the specification and in the claims.

The Office Action rejects claims 1 through 20. This Amendment amends claims 1, 5, 9, 10, 13, and 15. The applicant respectfully requests reconsideration.

The Office Action has rejects claims 9 and 10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter.

The Office Action asserts that it is unclear if the claimed subject matter is simply the pin or the combination of the pin and first and second sheets.

The applicant has amended claims 9 and 10 to express more clearly that the claimed subject matter is the pin. The applicant respectfully requests reconsideration of claims 9 and 10.

The Office Action has rejected claims 1-4, 8, 11, and 12 under 35 U.S.C. 102(b) as being anticipated by Ditka et al., U.S. Patent No. 5,867,958 (hereinafter *Ditka*). The Office Action asserts that *Ditka* discloses a drive pin comprising a shank with a head at one end, a tip at the other end, and a knurl formed as parallel spiral grooves having an angle encompassing the angles claimed in the claims 2 and 3.

With regard to independent claim 1, *Ditka* teaches an "anchor bolt 116...[comprising] a pointed tip portion 122, a head portion 124, and a shank portion 126 extending between the pointed tip portion 122 and the head portion 124." Nowhere in *Ditka* is the shape of pointed tip portion 122 discussed, other than to say it is pointed and suitable for penetrating concrete. In each of the Figures displaying pointed tip portion 122 (FIGs. 2, 3, and 5), *Ditka* clearly shown a tip that has facets, i.e., that is substantially pyramidal.

Independent claim 1 claims a drive pin comprising a ballistic tip. The applicant's use of the term "ballistic" is not arbitrary, and is supported in the specification at page 9, lines 11-20:

> Drive pin 20 has a substantially cylindrical shank 28 having a head 26 on one end and a ballistic tip 40 on the

> other end. Ballistic tip 40 is configured to penetrate material 22 and framing member 24 under force of the automatic nailer. To accomplish this, ballistic tip 40 is preferably bullet shaped. This shape allows ballistic tip 40 to pierce framing member 22 and create an opening therein substantially equal to base diameter 30 of shank 28 with minimal tearing and deformation. This provides an appropriate substantially cylindrical "clean" opening suited for the formation of threads....

The pyramidal tip of *Ditka* is not a "ballistic" tip as claimed in the present invention. *Ditka* does not disclose the structure claimed by the applicant.

Also, *Ditka* specifically teaches an "anchor bolt device" for use with pre-drilled holes in concrete. Therefore, the tip of the *Ditka* device need not be (and is not) designed to penetrate anything more than the air in the pre-drilled hole. It serves solely as a pointed end to guide the fastener into the pre-drilled hole. It would not be obvious to modify *Ditka* to use the ballistic tip of the present invention in a pre-drilled hole, as this would simply increase the cost of the *Ditka* fastener without serving any useful function.

With regard to non-pre-drilled holes, those skilled in the art will appreciate that the ballistic tip of the present invention, while suitable for sheet-metal framing members, is contra-indicated for use with concrete. Such a tip would cause chipping and fracturing of the concrete and would thereby produce a poor join at best. Most likely, the ballistic tip of the present invention would simply shatter the concrete, resulting in no join. Again, it would not be obvious to modify *Ditka* to use the ballistic tip of the present invention with undrilled concrete, as this would render *Ditka* an inferior fastener.

In addition, *Ditka* teaches a fastener whose shank has flutes or rib members. In *Ditka*, the purpose of the rib members is to increase pullout resistance. These rib members are imposed upon the shaft. That is, nowhere in *Ditka* is the diameter between the rib members less than the base diameter of the shaft. This is clearly indicated by FIG. 4, which fails to show a shaft diameter greater than the groove diameter.

In the present invention, the purpose of the rib members is to cut threads into and deform the hole in the framing member. For this reason, the grooves between the rib members have a diameter less than the base diameter of the shaft. This gives the material from the hole some place to go as it is deformed.

This is not necessary in *Ditka*. The normal diameter of the predrilled hole is greater than the shaft diameter. If it were not, the stress transferred to the concrete would cause microfracturing of the hole surface and would weaken the grip of the fastener. The flutes of *Ditka* are proportioned cut unto the concrete. The cut-away concrete material is free to go into the surrounding parts of the hole, i.e., ahead of and behind the flutes, to increase the fastener grip.

The functions of the *Ditka* and present invention fasteners are radically different. Likewise the functions of the grooves and ridges making up their flutes are different. The fact that the range of permissible flute angles in the *Ditka* fastener encompasses the range of permissible angles in the present invention is coincidental and would not inspire one skilled in the art to modify *Ditka* to be like the present invention.

The applicant has amended independent claim 1 to more positively recite the structure of the flutes and grooves and the material to which the drive pin will fasten. The applicant

believes independent claim 1 to be allowable as amended, and respectfully requests reconsideration thereof.

Claims 2-4, 8, 11, and 12 depend from allowable independent claim 1 and are therefore allowable as originally submitted by reason of dependency. The applicant respectfully requests reconsideration of claims 2-4, 8, 11, and 12.

The Office Action rejects claims 1-20 under 35 U.S.C. 103(a) as being unpatentable over Dove et al., U.S. Patent No. 3,977,142 (hereinafter *Dove*) in view of *Ditka* and Rosenberg, U.S. Patent No. 1,485,202 (hereinafter *Rosenberg*). The Office Action asserts that *Dove* teaches a drive pin for joining materials to sheet metal, which drive pin has parallel spiral grooves, but fails to teach the angles of those grooves. The Office Action further asserts that *Ditka* teaches groove angles within the range of those claimed by the present invention, but teaches a pin for joining materials to concrete. The Office Action then asserts that *Rosenberg* teaches a drive pin suitable for both concrete and sheet materials.

Dove, on the other hand, does teach a drive pin for attachment to sheet metal. However, *Dove* states (column 3, lines 47-52:

> [T]he fastener element 10 is seen to include a head 12, a first shank portion 14, a second shank portion 16 and a piercing point 17. The piercing point 17 is in effect the apex of a conical portion 18 located adjacent the second shank portion 16.

Dove then goes on to further describe the conical portion (column 4, lines 16-20):

> [T]he conical portion 18 is substantially a true cone, and there is an abrupt, angled transition at the base of the conical portion 18 from a conical configuration to a cylindrical configuration.

Dove specifically teaches the use of a distinctly conical tip. It is therefore not obvious to one of ordinary skill in the art to modify *Dove* to use a ballistic tip, as taught by the applicant, as that would violate *Dove*'s purpose. Moreover, combining the conical tip of *Dove* with *Ditka* still fails to teach the use of the ballistic tip claimed in claim 1.

Rosenberg, like *Ditka*, teaches a masonry anchorage device. The device of *Rosenberg* is neither intended for nor suitable for fastening to sheet metal, as the tips of *Rosenberg* and *Ditka* would tear and deform the sheet metal. It therefore would not be obvious to one of ordinary skill in the art to combine the masonry fasteners of *Rosenberg* and *Ditka* with the sheet-metal fastener of *Dove*.

In addition, *Ditka* and *Rosenberg* teach fasteners configured to fasten a material to masonry or concrete. As discussed hereinbefore, the form of a pin intended by either *Ditka* or *Rosenberg* to fasten to concrete via a predrilled hole is radically different from the form of a pin intended to fasten to undrilled sheet metal. The differences in these forms are so great that one skilled in the art of fasteners would not be inspired to modify concrete fasteners for use with sheet metal.

Dove does teach a fastener configured to fasten a material to sheet metal. The *Dove* fastener, however, differs from the present invention in several basic areas. As discussed hereinbefore, *Dove* teaches a specific conical point. The conical point of *Dove* is sufficiently specific as to have several

descriptions of its characteristics in the *Dove* specification. In view of this strong emphasis, one skilled in the art would not find it obvious to substitute the conical point of *Dove* for the ballistic point of the present invention.

Independent claims 1, 13, and 20 all specifically claim a ballistic tip as discussed hereinbefore. Neither *Ditka* nor *Rosenberg* nor *Dove* teaches such a tip. Since *Dove* specifically teach away from any but a conical tip, it would not be obvious to one of ordinary skill in the art to modify *Dove* to use a ballistic tip.

The applicant has amended independent claims 1 and 13 to more positively recite the ballistic tip, the flutes and grooves, and the material to which the drive pin will fasten. The applicant believes independent claims 1 and 13 to be allowable as amended. The applicant believes independent claim 20 to be allowable as originally submitted. The applicant respectfully requests reconsideration of independent claims 1, 13, and 20.

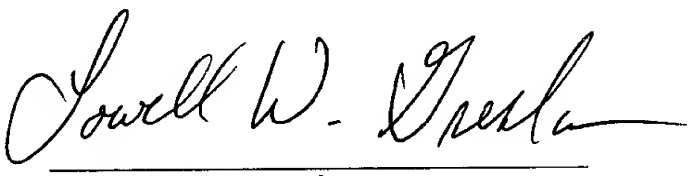
Claims 2-12 depend from allowable independent claim 1, and claims 14-19 depend from allowable independent claim 13. Claims 2-12 and 14-19 are therefore allowable by reason of dependency.

The applicant has amended claims 9 and 10 for reasons discussed hereinbefore. The applicant has amended claim 5 and 15 to reflect the amendments to independent claims 1 and 13, from which they respectively depend. The applicant believes claims 9, 10, and 15 to be allowable as amended, and believes claims 2-4, 6-8, 11, 12, 14, and 16-19 to be allowable as originally submitted. The applicant respectfully requests reconsideration of claims 2-12 and 14-19.

Accordingly, this Amendment amends claims 1, 9, 10, 13, and 15. Once-amended claims 1, 9, 10, 13, and 15 remain in the application and are believed to be allowable. In addition, claims 2-8, 11, 12, 14, and 16-20 remain in the application as originally filed and are believed to be allowable.

The applicant believes that the foregoing amendments and remarks are fully responsive to the rejections and objections recited in the 05 June 2002 Office Action and that the present application is now in a condition for allowance. Accordingly, reconsideration of the present application is respectfully requested.

Respectfully submitted,



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APPENDIX A

This Appendix is one page and contains a marked-up copy of the amended title.

The title is amended as follows:

**DRIVE PIN FOR FASTENING [~~A MATERIAL~~]
TO A SHEET-METAL [~~BASE~~] FRAMING MEMBER**

The paragraph beginning on page 5, line 22, is amended as follows:

Several attempts have been made to produce a drive pin with increased grip in the thinner sheet metals. The most successful of which is the use of spiral [~~flute~~] flutes cut with annular rings. The annular rings cut the thin metal more cleanly, thereby increasing the quality of the threads and improving the grip. Unfortunately, this approach offers only marginal improvement when used with the thinnest sheet metals, i.e., 18 to 25 gauge (0.0428 to 0.0179 inch), often used for framing members in light commercial and residential construction.

APPENDIX B

This Appendix is two pages and contains a marked-up copy of each of original claims 1, 5, 9, 10, 13, and 15 depicting the amendments thereto.

1. (Once Amended) A drive pin for the fastening of a material to a sheet-metal [~~base~~] framing member with an automatic nailer, said drive pin comprising:

a substantially cylindrical shank having a base diameter;

a head coupled to said shank;

a knurl rolled upon said shank, said knurl having a plurality of substantially parallel spiral grooves, wherein said spiral grooves have a minor diameter less than said base diameter, and wherein each of said spiral grooves subtends an angle of at least 15 degrees relative to an axis of said shank; and

a ballistic tip coupled to said shank and configured to penetrate said material and said sheet-metal [~~base~~] framing member under force of said automatic nailer.

5. (Once Amended) A drive pin as claimed in claim 4 wherein:

said [~~shank has a~~] base diameter [~~in~~] has a range of 0.0625 to 0.125 inch;

[~~said spiral grooves have a minor diameter less than said base diameter;~~] and

said spiral ridges have a major diameter greater than said base diameter.

9. (Once Amended) A drive pin as claimed in claim 1 wherein[~~: said metal base member is a first sheet metal;~~], when said material is [~~a second~~] sheet metal[~~; and~~], said knurl is rolled tight to said head.

10. (Once Amended) A drive pin as claimed in claim 1 wherein[~~:~~], when said material is gypsum sheathing[~~; and~~], said head is a cupped bugle head.

13. (Once Amended) A construction assembly effected by an automatic nailer, said construction assembly comprising:

a sheet-metal [~~substrate~~] framing member;

a material attached to said sheet-metal [~~substrate~~] framing member; and

a drive pin attaching said material to said sheet-metal [~~substrate~~] framing member, said drive pin comprising:

a substantially cylindrical shank;

a head coupled to said shank;

a knurl formed of a plurality of threads rolled full upon said shank to produce a plurality of substantially parallel spiral grooves, wherein each of said spiral grooves subtends an angle of no less than 15 and no greater than 30 degrees relative to an axis of said shank; and

a ballistic tip coupled to said shank and configured to penetrate said material and said sheet-metal [~~substrate~~] framing member under force of said automatic nailer.

15. (Once Amended) A construction assembly as claimed in claim 13 wherein said [~~sheet-metal substrate is a~~] sheet-steel framing member [~~having~~] has a thickness of 0.0179 to 0.0966 inch.